SEQUENCE LISTING

<110> BARBAS, Carlos
STEGE, Justin
GUAN, Xueni
DALMIA, Bipin

<120> METHODS AND COMPOSITIONS TO MODULATE
EXPRESSION IN PLANTS

<130> 27801-20014.20

<140> 09/765,555
<141> 2001-01-19

<150> 09/620,897
<151> 2000-07-21

<150> US 60/177,468
<151> 2000-01-21

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c 3121

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<210> 7
<211> 18
<212> DNA
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<220>
<223> ZFPAp3

<400> 7
gatggagttg aagaagta 18

<210> 8
<211> 21
<212> DNA
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<220>
<223> ZFP from -85 to -65

<400> 8
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<210> 9
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<223> ZFPm1 from -68 to -85

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<400> 10
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<400> 11
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<223> ZFPm3 from 311 to 294

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<223> ZFPm4 from 317 to 300

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protein ZFPm1

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<220>
<223> Partial sequence of pMal-m2 and zinc finger
protein ZFPm2

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protein ZFPm3

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protein ZFPm4

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<220>
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<223> Primer NZlib5'

<400> 31
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<210> 32
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<223> Primer Ap3f4-R

<400> 32
ctcctctaat acgactcact atagggacac tcacctagcc tctg 44

<210> 33
<211> 21

<212> DNA
<213> Artificial Sequence

<220>
<223> Primer m4f3

<400> 33
cctcgcaaga tcacgacaat c 21

<210> 34
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR probe for AP3

<400> 34
ccatttcatc ctcaagacga cgcagct 27

<210> 35
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> PCR primer for AP3 (forward)

<400> 35
tttggacgag cttgacattc ag 22

<210> 36
<211> 20
<212> DNA
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<220>
<223> PCR primer for AP3 (reverse)

<400> 36
cgcgaacgag tttgaaagtg 20

<210> 37
<211> 44
<212> DNA
<213> Artificial Sequence

<220>
<223> Oligonucleotide

<400> 37
ctcctctaat acgactcact atagggacac tcacctagcc tctg 44

<210> 38
<211> 184
<212> PRT
<213> Artificial Sequence

<220>
<223> ZFPm1

<400> 38
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Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser
        35                  40                  45
Phe Ser Gln Arg Ala His Leu Glu Arg His Gln Arg Thr His Thr Gly
    50                  55                  60
Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser Phe Ser Gln Ser
65                  70                  75                  80
Ser Asn Leu Val Arg His Gln Arg Thr His Thr Gly Glu Lys Pro Tyr
                85                  90                  95
Ala Cys Pro Glu Cys Gly Lys Ser Phe Ser Arg Ser Asp Asn Leu Val
            100                 105                 110
Arg His Gln Arg Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu
        115                 120                 125
Cys Gly Lys Ser Phe Ser Arg Ser Asp Asn Leu Val Arg His Gln Arg
    130                 135                 140
Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser
145                 150                 155                 160
Phe Ser Gln Ala Gly His Leu Ala Ser His Gln Arg Thr His Thr Gly
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Lys Lys Thr Ser Gly Gln Ala Gly
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<210> 39
<211> 184
<212> PRT
<213> Artificial Sequence

<220>
<223> ZFPm2

<400> 39

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Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser
        35                  40                  45
Phe Ser Gln Ser Ser Asn Leu Val Arg His Gln Arg Thr His Thr Gly
    50                  55                  60
Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser Phe Ser Arg Ser
65                  70                  75                  80
Asp Asn Leu Val Arg His Gln Arg Thr His Thr Gly Glu Lys Pro Tyr
                85                  90                  95
Ala Cys Pro Glu Cys Gly Lys Ser Phe Ser Arg Ser Asp Asn Leu Val
            100                 105                 110
Arg His Gln Arg Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu
        115                 120                 125
Cys Gly Lys Ser Phe Ser Gln Ala Gly His Leu Ala Ser His Gln Arg
    130                 135                 140
Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser
145                 150                 155                 160
Phe Ser Arg Ser Asp Asn Leu Val Arg His Gln Arg Thr His Thr Gly
                165                 170                 175
Lys Lys Thr Ser Gly Gln Ala Gly
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<211> 184
<212> PRT
<213> Artificial Sequence

<220>
<223> ZFPm3

<400> 40
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            20   25   30
Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser
        35   40   45
Phe Ser Thr Ser Gly Ser Leu Val Arg His Gln Arg Thr His Thr Gly
    50   55   60
Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser Phe Ser Gln Ser
65   70   75   80
Ser Ser Leu Val Arg His Gln Arg Thr His Thr Gly Glu Lys Pro Tyr
                85   90   95
Ala Cys Pro Glu Cys Gly Lys Ser Phe Ser Gln Ser Ser Ser Leu Val
            100   105   110
Arg His Gln Arg Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu
        115   120   125
Cys Gly Lys Ser Phe Ser Asp Ser Arg Asp Leu Ala Arg His Gln Arg
    130   135   140
Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser
145   150   155   160
Phe Ser Gln Ser Ser His Leu Val Arg His Gln Arg Thr His Thr Gly
                165   170   175
Lys Lys Thr Ser Gly Gln Ala Gly
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<210> 41
<211> 184
<212> PRT
<213> Artificial Sequence

<220>
<223> ZFPm4

<400> 41
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Cys Gly Lys Ser Phe Ser Gln Ser Ser Ser Leu Val Arg His Gln Arg
            20   25   30
Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser
        35   40   45
Phe Ser Gln Ser Ser Ser Leu Val Arg His Gln Arg Thr His Thr Gly
    50   55   60
Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser Phe Ser Asp Cys
65   70   75   80
Arg Asp Leu Ala Arg His Gln Arg Thr His Thr Gly Glu Lys Pro Tyr
                85   90   95
Ala Cys Pro Glu Cys Gly Lys Ser Phe Ser Gln Ser Ser Ser Leu Val
            100   105   110
Arg His Gln Arg Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu
        115   120   125
Cys Gly Lys Ser Phe Ser Arg Ser Asp Asn Leu Val Arg His Gln Arg
    130   135   140
Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser
145   150   155   160
Phe Ser Thr Ser Gly His Leu Val Arg His Gln Arg Thr His Thr Gly
                165   170   175
Lys Lys Thr Ser Gly Gln Ala Gly
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<210> 42
<211> 184
<212> PRT

<213> Artificial Sequence

<220>
<223> ZFPAp3

<400> 42
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            20   25   30
Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser
        35   40   45
Phe Ser Gln Ser Ser Asn Leu Val Arg His Gln Arg Thr His Thr Gly
    50   55   60
Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser Phe Ser Gln Ser
65   70   75   80
Ser Asn Leu Val Arg His Gln Arg Thr His Thr Gly Glu Lys Pro Tyr
                85   90   95
Ala Cys Pro Glu Cys Gly Lys Ser Phe Ser Thr Ser Gly Ser Leu Val
            100   105   110
Arg His Gln Arg Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu
        115   120   125
Cys Gly Lys Ser Phe Ser Gln Ser Ser His Leu Val Arg His Gln Arg
    130   135   140
Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser
145   150   155   160
Phe Ser Thr Ser Gly Asn Leu Val Arg His Gln Arg Thr His Thr Gly
                165   170   175
Lys Lys Thr Ser Gly Gln Ala Gly
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<210> 43
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Promoter 18bp 2C7

<400> 43
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<210> 44
<211> 7
<212> PRT
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<220>
<223> ZFP domain

<400> 44
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<210> 45
<211> 7
<212> PRT
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<220>
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<400> 45
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1 5

<210> 46
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<220>
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<400> 46
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1 5

<210> 47
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<220>
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<400> 47
Ser Thr Ser Gly Asn Leu Val
1 5

<210> 48
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<220>
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<400> 48
Ser Gln Ser Gly Asp Leu Arg Arg
1 5

<210> 49
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<220>
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<400> 49
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<210> 50
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<400> 50
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<210> 51
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<400> 51
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<210> 52
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<400> 52
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<210> 53
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<400> 53
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<210> 55
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<210> 56
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<223> ZFP domain

<400> 56
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<210> 57
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<400> 57
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<210> 58
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<400> 58
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<210> 59
<211> 8
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<220>
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<400> 59
Ser Arg Ser Asp Val Leu Val Arg
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<210> 60
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<400> 60
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<210> 61
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<400> 61
Ser Thr Ser Gly Ser Leu Val Arg

1 5

<210> 62
<211> 8
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<220>
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<400> 62
Ser Gln Ala Gly His Leu Ala Ser
1 5

<210> 63
<211> 330
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<220>
<223> ZFPm2a

<400> 63
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ggtgaaaaac cgtataaatg cccagagtgc ggcaaatctt ttagccaggc cggccacctg 180
gccagccatc aacgcactca tactggcgag aagccataca aatgtccaga atgtggcaag 240
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agtggccagg ccggccagct cctcctcctc 330

<210> 64
<211> 330
<212> DNA
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<220>
<223> ZFP2b

<400> 64
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ggtgaaaaac cgtataaatg cccagagtgc ggcaaatctt ttagccagtc cagcaacctg 180
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agtggccagg ccggccagct cctcctcctc 330

<210> 65
<211> 18
<212> DNA
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<220>
<223> Oligonucleotide

<400> 65
gagtgagagg aggaagga 18

<210> 66
<211> 5731
<212> DNA
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<220>
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aaaccgtata aatgcccaga g 81

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<212> DNA
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<223> Primer F1-f2

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<213> Artificial sequence

<220>
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<210> 70
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<212> DNA
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<220>
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<210> 71
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<220>
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<210> 72
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<212> DNA
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ccggacgaga ttgtcagacc g 81

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<220>
<223> 3 finger protein C7

<400> 73
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tctaagtcgg ctgatctgaa gcgccatatc cgcatccaca caggccagaa gcccttccag 120
tgtcgaatat gcatgcgtaa cttcagtcgt agtgaccacc ttaccaccca catccgcacc 180
cacacaggcg agaagccttt tgcctgtgac atttgtggga ggaagtttgc caggagtgat 240
gaacgcaaga ggcataccaa aatccattta agacagaagg actctagaac tagtggccag 300
gccggccagg ctagc 315

<210> 74
<211> 105
<212> PRT
<213> Artificial sequence

<220>
<223> Amino acid sequence of 3 finger protein C7

<400> 74
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Asp Arg Arg Phe Ser Lys Ser Ala Asp Leu Lys Arg His Ile Arg Ile
            20   25   30
His Thr Gly Gln Lys Pro Phe Gln Cys Arg Ile Cys Met Arg Asn Phe
        35   40   45
Ser Arg Ser Asp His Leu Thr Thr His Ile Arg Thr His Thr Gly Glu
    50   55   60
Lys Pro Phe Ala Cys Asp Ile Cys Gly Arg Lys Phe Ala Arg Ser Asp
65   70   75   80
Glu Arg Lys Arg His Thr Lys Ile His Leu Arg Gln Lys Asp Ser Arg
                85   90   95
Thr Ser Gly Gln Ala Gly Gln Ala Ser
            100   105

<210> 75
<211> 184
<212> PRT
<213> Artificial sequence

<220>
<223> Zinc finger protein ZFPm1

<400> 75
Ala Gln Ala Ala Leu Glu Pro Gly Glu Lys Pro Tyr Ala Cys Pro Glu
 1   5   10   15
Cys Gly Lys Ser Phe Ser Asp Pro Gly His Leu Val Arg His Gln Arg
            20   25   30
Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser
        35   40   45
Phe Ser Gln Arg Ala His Leu Glu Arg His Gln Arg Thr His Thr Gly
    50   55   60
Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser Phe Ser Gln Ser
65   70   75   80
Ser Asn Leu Val Arg His Gln Arg Thr His Thr Gly Glu Lys Pro Tyr
                85   90   95
Ala Cys Pro Glu Cys Gly Lys Ser Phe Ser Arg Ser Asp Asn Leu Val
            100   105   110
Arg His Gln Arg Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu
        115   120   125
Cys Gly Lys Ser Phe Ser Arg Ser Asp Asn Leu Val Arg His Gln Arg
    130   135   140
Thr His Thr Gly Glu Lys Pro Tyr Lys Cys Pro Glu Cys Gly Lys Ser
145   150   155   160
Phe Ser Gln Ala Gly His Leu Ala Ser His Gln Arg Thr His Thr Gly
                165   170   175
Lys Lys Thr Ser Gly Gln Ala Gly
            180

<210> 76
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Zinc finger protein ZFPm1 and ZFPm2 binding site m12

<400> 76
gcctccttcc tcctctcact c   21

<210> 77
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> Zinc finger protein ZFPm3 and ZFPm4 binding site m34

<400> 77
gccaactact acggctccct cacc 24

<210> 78
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Zinc finger peptide linker

<400> 78
Thr Gly Glu Lys Pro
1 5

<210> 79
<211> 6
<212> PRT
<213> Artificial sequence

<220>
<223> DNA binding motif

<400> 79
Gln Ala Leu Gly Gly His
1 5